

# EXHIBIT G



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STATE OF WASHINGTON  
DEPARTMENT OF ECOLOGY

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March 28, 2000

Mr. Richard Woolley, Plant Manager  
Centralia Power Plant  
913 Big Hanaford Road  
Centralia, WA 98531

RE: Request for Prevention of Significant Deterioration Program Applicability Determination,  
Dated March 15, 2000

Dear Mr. Woolley:

I have reviewed the above request, information supplied during our meeting of December 14, 1999, subsequent correspondence and meetings clarifying the request, and the Prevention of Significant Deterioration (PSD) regulation, applicable guidance documents, and regulatory preambles developed by the Environmental Protection Agency (EPA) on the application of the special PSD applicability criteria for installation of pollution control projects at Electric Utility Steam Generating Units. The request for applicability determination submitted by the Centralia Plant Owners includes the pollution prevention project being installed to meet the emission limits set by the Southwest Air Pollution Control Authority in Order No. 97-2057 (Reasonably Available Control Technology (RACT) order,) and specific additional changes that may be constructed at the same time the emission controls are installed that will slightly increase Centralia's megawatt output capabilities.

The pollution control project ("PCP") and the other changes to be constructed are comprised of the following elements and collectively referred to as the "Project":

- Installation and operation of Low NOx burners and other combustion modifications to the boiler to minimize NOx emissions.
- Installation and operation of a wet limestone SO<sub>2</sub> control system including the installation of increased induced draft fan capacity to overcome the energy losses through the SO<sub>2</sub> control system.
- Re-installation of low temperature superheater tubing into the boiler system.
- Replacement of existing turbine rotors with current design, more efficient turbine rotors.
- Maintenance replacement of fill material in the unit 1 cooling tower.
- Maintenance replacement of the air preheater basket.
- Maintenance replacement of coal pulverizer vane wheels.
- Maintenance refurbishment (retipping) of primary air fans.
- Increased fuel feed rate to replace energy losses from the low NOx burner system and to maintain net power output from the generating station.

Additional details of the Project are found in the request for PSD applicability.

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The Project will result in a net emission reduction for most pollutants. For all pollutants except CO, emissions under the RACT order, in terms of lb./hr., are lower than the Plant's current emissions. However, the Project involves projected potential emission increases due to: (1) the installation of the low NOx burners; and (2) an increased fuel feed rate to offset the reduction in net power output caused by the pollution control project.

In general, the PSD rules allow emissions changes (increases) that result solely from the installation of the pollution control project to be excluded from the determination of a net emissions increase. The emission increase in CO comes almost entirely from the installation of the low NOx burner system modifications. There is a much smaller increase in CO due to the proposed increase in fuel feed rate. Dispersion modeling was performed and submitted to the Southwest Air Pollution Control Authority and Ecology in 1997 as part of the development of the RACT Analysis prepared by the plant. That analysis indicated that the emissions increase in CO would not cause an exceedance of the CO National Ambient Air Quality Standards nor affect the attainment status of any CO non-attainment area. Thus, in this case, the increase in CO emissions due to installation of the low NOx burners is exempt from PSD permitting requirements.

Emission increases that can be accommodated without the Project or any other physical or operational change at the plant, and which will result solely from increases in capacity factor to meet demand growth are also projected. This will result mostly in operating the plant at capacity for more hours per day and more days per year. The new owners of the plant anticipate that there will be an increase in annual emissions from the plant's current capacity factor of about 75% up to the projected 89% capacity factor to meet demand growth. The PSD regulations exempt this emissions increase from being subject to PSD permitting requirements.

The Plant may also increase its gross power output (and emissions) to compensate for the power load of the emission controls and maintain current net power output without triggering PSD permitting requirements, provided no physical change or change in the current method of operation is required to accommodate such increases. Increases in fuel consumption (and emissions due to the increased fuel consumption) necessary to offset the pollution control project's reduction in net power output are not specifically addressed in the PSD definition of a major modification (40 CFR 52.21(b)(2)). The Federal Register preamble to the 1992 PSD rule amendment indicates that the test for PSD applicability is whether a physical change or change in the method of operation is necessary to accommodate the fuel feed rate increase. The guidance indicates that in specific situations, the exempt pollution control project could be the physical change that allows higher emission rates to occur. Only if a physical change or change in the method of operation is required would the emissions increase resulting from the change being used in calculating the net emissions increase of the project.<sup>1</sup>

The Request for Applicability Determination, the Centralia Plant RACT analysis and other information available to Ecology demonstrates the capabilities of the plant's fuel feed system and boiler capabilities. This information indicates that the current fuel feed rates are well below the fuel feed system's capabilities and boiler capacity. Thus, the proposed coal feed rate increases can be accomplished without a physical change to the boilers; their fuel feed systems, primary air fans, or induced draft fans. Additionally, an analysis of the emissions change from existing levels to the

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<sup>1</sup> At this facility, the emissions increase in CO is collateral to the NOx emissions decrease. As noted above, the pollution control project criteria allows the CO increase to be exempt from the requirements for PSD permitting.

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controlled emission rates following the installation of the pollution control project indicate that there will not be a "significant" increase in any pollutant as defined by the PSD rules. Thus the emissions change due to the proposed increased fuel feed rate will not require a PSD permit.

The portions of the Project that include the reinstallation of low temperature superheater boiler tube, maintenance replacement of fill material in the unit 1 cooling tower, maintenance replacement of the air preheater basket, and replacement of existing steam turbine rotors with current design, more efficient turbine rotors, do not affect the emissions from the facility. Due to specific characteristics of this facility, these modifications are not subject to PSD or other air permit requirements. The result of these modifications is an increase in the overall plant efficiency in converting the energy in coal to electrical energy as expressed in terms of kW of electricity per ton of coal fired, but does not affect or increase the capacity of the plant to burn fuel.

After applying the requirements for applying the steam utility plant pollution control project criteria and methodology, the standard methodology to determine whether a net increase in emissions (for those portions of the Project not covered by the pollution control project criteria), and taking into consideration the emission limitations contained in the RACT order, the Project will result in a reduction in total emissions for all pollutants except CO when evaluated on both an hourly and annual basis. As noted above, the increase in CO emissions is not subject to permitting under the PSD program.

The proposed Project described in the request for PSD applicability does not require review and permitting under the PSD program.

EPA Region 10 policy and PSD permitting staff have been consulted in making this determination and have reviewed this letter prior to its issuance. The regional EPA staff has consulted with headquarters staff on this issue. Based on their consultations with headquarters and review of the information, the regional EPA staff concurs with this determination.

If you have any questions or concerns you can contact me at (360) 407-6810 or by e-mail at [anew461@ecy.wa.gov](mailto:anew461@ecy.wa.gov). Thank you.

Sincerely,



Alan R. Newman, PE  
Senior Engineer  
Air Quality Program

AN:jr  
Enclosure

cc: Ray Nye, EPA Region 10  
Paul Mairose, SWAPCA  
Lenora Westbrook, PacifiCorp, Portland  
Brian Clewes, TransAlta, Centralia  
Yves Tremblay, Trans Alta, Calgary

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## Evaluation of Centralia Power Plant Request for PSD applicability

The letter gives an overview of the total project being submitted for PSD applicability. Portions of the project are directly related to the installation of the RACT emissions control required by the RACT order from SWAPCA. Other portions of the proposal are to maintain the current net power output from the facility, while others are related to routine maintenance activities and improving the overall power generating efficiency of the facility.

The following is how I (Alan Newman) evaluated these changes to determine their PSD applicability and whether any part of the project is subject to PSD permitting requirements.

EPA developed a "pollution control project exemption" (from being a major modification) in response to the Wisconsin Electric Power Co. Port Washington court decision and the advent of the federal Acid Rain program. The modification to the PSD regulations provide for 3 differences in how PSD applicability is made for the installation of pollution control projects at steam electric utility plants. First the act of installing the pollution control project is not subject to PSD, on its own. Second any emission increases that occur as a direct result of the pollution control project that do not adversely affect ambient air quality do not have to go through the PSD process. Third the regulation changes how the future emissions are estimated for use in determining if a net emissions increase will occur.

## Regulatory Considerations

In 1992, EPA amended the PSD regulations. The preamble of the 1992 PSD final rule amendment provides guidance on several principles relevant to evaluating PSD applicability to the Centralia Project: (1) the pollution control project exemption, (2) exempt emissions increases due to demand growth, and (3) emission increases due to non-exempt physical changes. The preamble describes these types of emission changes as follows:

1. Emission Increases resulting from a pollution control project are exempt, provided the pollution control project is environmentally beneficial and air quality standards are not exceeded.<sup>1</sup> In this case, CO emissions increase due to the low NOx burner system.

<sup>1</sup> Federal Register Volume 57, No. 140, July 21, 1992, Page 32320, An evaluation of whether an emissions increase associated with the pollution control project renders the project "less environmentally beneficial" than before must be conducted. See also 40 CFR 60.14(c)(5), 57 FR 140, page 32321 Column 1-2, the discussion on "collateral" emissions increases due to the pollution control project. See also Page 32322, Section C. Additional Modeling Requirements.

2. Emission Increases due to growth in electrical demand are exempted from consideration. Determining net emission increases for electric utility steam generator units involves a comparison of actual emissions for a past two-year representative period with future "representative actual annual emissions" (40 CFR 52.21(b)(33)). The calculation of representative actual annual emissions involves the hourly emissions rate after the change times the anticipated capacity factor during the future time period (2 years of the first 5 years after the change). In this case, the future representative annual emissions are the emission rates at the current 76.37% capacity factor expanded to the anticipated 89% capacity factor. The demand increase exemption applies to the proposed change in capacity factor because the Plant can achieve the 89% without modifications and the proposed changes do not appear to be a reason for the increased capacity factor. Thus, any emissions increase due to the projected demand growth is not used in determining a net emissions increase.
  
3. Emission increases from "modifications" that occur during the installation of a pollution control project are to be evaluated for PSD applicability. Conversely, if an emission increase (i.e., due to increase in fuel feed rate to the boiler to maintain net power output) is capable of being accommodated without physically modifying the facility, then the increase is not used in calculating net emissions increases.<sup>2</sup> In this situation, the increase in fuel feed rate to offset the energy and net power losses due to the pollution control project should be evaluated on its own merits rather than as part of the pollution control project.

The Centralia Project can be separated into the following categories for evaluating PSD applicability: (1) the pollution control project; (2) the increase in fuel feed rate to offset thermal losses from the low NOx burner system and the "house power" consumption of the SO2 scrubber; and (3) the proposed modification to the steam production process (low temperature superheaters and cooling tower packing replacement) and improved efficiency of the steam turbines.

In calculating emissions to determine PSD applicability, the PSD program evaluates emissions changes in terms of mass per year (tons or Mg per year) not in units like pounds or kilograms per hour, pounds per million Btu or kilograms per joule or parts per million. Such emission limitations need to be converted through accepted means to

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<sup>2</sup> 57 FR 140 Page 32326 et seq., Section C, *The Causation Requirement*. Specifically on page 32327 "In EPA's view ... operational levels that a unit could not have achieved during the representative baseline period but for the physical or operational change are considered to result from that change. Post change emissions increases associated with such operational levels must, therefore be considered to result from the change and be taken into account for NSR applicability purposes." See also previous footnote. Also 40 CFR 52.21(33)(ii).

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the tons or megagram per year format. PSD applicability is then calculated on the basis of a 2 year average of past actual emissions (Mg/yr) compared to a calculated, post change potential emissions (Mg/yr).

In the case of electric utility power plants the language of the 1992 Preamble<sup>3</sup> uses a different test to determine emissions increases. Generally the calculation uses the same past actual emissions rates and the concept of "future actual emissions". The basis of comparison is then modified from the Mg/yr unit to a kg/hr or mass per unit of fuel fired (kg/Mg) basis. Emission increases are not in terms of mass per unit of energy fired (kg/J).<sup>4</sup> The determination of net emissions increase is then based on the hourly emissions rates and a defined unit capacity utilization rate based on past utilization. The determination of the net emissions change is then based on the products of the past actual emissions and the capacity utilization compared to the future actual emissions times the capacity utilization to determine if a PSD significant emissions increase has occurred.<sup>5</sup>

The guidance from EPA in the preamble of the 1992 WEPCO final rule amendment breaks the applicability of the pollution control project exemption away from simple demand growth and from emission increases unrelated to demand growth and the pollution control project. The consideration of PSD applicability of emissions increases and decreases due to a pollution control project breakdown as follows:

1. Emissions increases resulting solely from the pollution control project are clearly exempt. The emission increases that occur are not for the pollutants controlled by the project.<sup>6</sup>  
In this case CO increases due to the Low NOx burner system.
2. The increase in emissions due to growth in electrical demand is treated separately. If this demand growth is applied across the total generating system it is not subject to PSD review. If the growth is focused on the unit(s) getting the pollution control project, the emission increases are subject to PSD review. EPA considered these increases to occur because the unit(s) have greater availability, reliability, capability, etc., and not due solely to demand growth.<sup>7</sup>

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<sup>3</sup> Multiple locations in the preamble also make this clarification. See 57 FR 140 Pages 32322 Col. 1, 32323 Col. 2, 32325 Col. 2. Also 40 CFR 52.21(33).

<sup>4</sup> 40 CFR 52.21(3) Net emissions increase, (23) Significant

<sup>5</sup> Emissions (lb./hr) X Capacity Factor (% of year operating) X 8760 Hrs/year = \_\_\_\_\_ Tons per year of emissions  
2000 b/ton

<sup>6</sup> Federal Register Volume 57, No. 140, July 21, 1992, Page 32320, An evaluation of whether an emissions increase associated with the pollution control project is needed to determine if it renders the project "less environmentally beneficial" than before. See also 40 CFR 60.14(e)(5). 57 FR 140, page 32321 Column 1-2, the discussion on "collateral" emissions increases due to the pollution control project. See also Page 32322, Section C. *Additional Modeling Requirements*.

<sup>7</sup> 57 FR 140, page 32327, column 1, "... demand growth can only be excluded to the extent that it — and not the physical or operational change — is the cause of the emissions increase". In Column 2 "... EPA considers emissions increases due to increased operations that could not be physically or legally accommodated during the

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EPA wrote this preamble before the concept of electric utility deregulation was considered. I believe that the concept of demand increase can be applied to the proposed change in capacity factor to 89% from the 76% that currently exists and was used in estimating emissions for the RACT order. Thus any emissions increase due to the project demand growth is not useable in determining a net emissions increase.

3. If there are projects that on their own meet the definition of a Major Modification that just happen to occur during the installation of a pollution control project, the emissions increase due to those projects are to be evaluated for PSD applicability. {Conversely if an emission increase proposed as part of a larger pollution control project is capable of being accommodated (i.e. increase in fuel feed rate to the boiler) without physically modifying the facility, then the increased emissions are not subject to review under PSD}.<sup>6</sup>

In this situation the increase in fuel feed rate to offset the energy and net power losses due to the pollution control project needs to be evaluated on its own merits rather than as part of the pollution control project. If the pollution control project exemption did not exist, for this power plant PSD applicability for this change would be subject to evaluation of whether it can be accommodated without a physical change or change in the method of operation.

The Centralia proposal is made up of a series of actions that can be separated in effect under the pollution control project exemption and other aspects of the PSD program. First is the description and effects of the pollution control project itself. Next is the desire/need to increase fuel feed rate to offset thermal losses from the low NOx burner system and the "house power" consumption of the SO2 scrubber. Third is the proposed modifications to the steam production process (reinstallation of low temperature superheaters and coincidental periodic replacement of cooling tower packing) and efficiency increase for the steam turbines through a rotor replacement.

#### ***The Pollution Control Project***

The pollution control project to be undertaken involves adding controls to reduce NOx and SO<sub>2</sub>. These controls are required as part of the RACT Order issued to the facility by SWAPCA.

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representative baseline period but for the proposed physical or operational change to result form the change". Also 40 CFR 52.21(33)(ii).

<sup>6</sup> 57 FR 140 Page 32326 et seq., Section C., *The Causation Requirement*. Specifically on page 32327 "In EPA's view ... operational levels that a unit could not have achieved during the representative baseline period but for the physical or operational change are considered to result form that change. Post change emissions increases associated with such operational levels must, therefore be considered to result from the change and be taken into account for NSR applicability purposes." See also previous footnote. Also 40 CFR 52.21(33)(ii).

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The NOx reduction portion of the project involves replacement of the existing coal burners with a system of Low NOx burners and other modifications to the combustion system to reduce the quantity of thermal NOx produced. This will result in 2 impacts. First there will be an increase (up to doubling) in the concentration and quantity of CO emitted. Second there will be an increase in unburned carbon passed to the ESPs due to the lowered combustion temperature. To generate the same net BTU to the boiler, the coal feed rate will need to be increased.

The SO<sub>2</sub> control portion of the pollution control project involves the installation of a wet limestone scrubber system. The scrubber system will increase the head loss through the total boiler system to the extent that the ID fan capacity will need to be increased to offset the head loss through the scrubber system. The increased fan capacity must be balanced against the susceptibility of the boiler to implode and the gas flow rate requirements of the new scrubber and stack. The chosen fan motor combination is the largest units that can be accommodated within the existing fan housing.

***Fuel feed rate increases to offset pollution control project impacts on plant electrical output.***

The plant intends to offset the impacts on the net power output of the facility caused by the low NOx burners and the power demands of the SO<sub>2</sub> control system by increasing the fuel feed (firing) rate to the boilers. The fuel feed system has demonstrated the capacity of feeding more fuel to the boilers than the anticipated fuel feed rate increase needed to offset the power consumed by the NOx and SO<sub>2</sub> control systems. There is one potential restriction to the fuel feed system and that is when the coal quality differs in heating value or hardness from the design criteria of the coal pulverizers. The pulverizers are designed to accommodate the average coal quality and hardness from the mine.

Each boiler section has 8 coal pulverizers. Under normal operating conditions at the current rated capacity and average fuel hardness, the boilers can operate with 7 pulverizers in operation. On occasion, the plant operates with all 8 coal pulverizers in operation. The reason for using all coal pulverizers is solely from the quality of the coal. As can be seen in the supporting documents for the Request of PSD Applicability, when the coal fed into the pulverizers is other than optimum hardness or Btu content, their total Btu throughput is reduced. The maintenance activities proposed as part of the Project are not designed or intended to increase coal feed capacity.

The other potential impediment to the ability of the plant to feed fuel at a higher rate is the impact of the existing ID fans. During periods of high ambient temperature, the fans are unable to draw enough flue gas through the boilers to allow combustion at the maximum fuel feed rate. However, the maximum anticipated coal feed can be accommodated by the current facility without the need to modify any existing equipment.

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The increase in fuel feed rates to offset the power load of the pollution control project needs to be evaluated to determine whether the increased fuel feed rate can be achieved without a physical modification or change in the method of operation.

### ***Steam production and steam turbine changes***

The plant plans to increase the electrical output of the facility separately from the installation of the pollution control project. Once the existing impediment of the ID fan capacity is reduced/eliminated, the plant may reinstall the low temperature superheater tubes into the boiler to reduce the temperature of the flue gas exiting the boiler. The purpose of the low temperature superheater is to reduce flue gas temperature exiting the boiler below the temperature limits of the steel used in the flue gas ducting. This boiler section was removed due to head loss concerns in the flue gas stream and pressure drop concerns in the superheater section and does not affect total steam generation capacity, just the quality of the steam produced.

The Centralia Power plant's electrical generation from the turbine is limited by the steam production and heat release in the boiler. Unlike many power plants, the Centralia units are limited by boiler capacity rather than steam turbine limited. The current turbines have the capacity to handle more steam than the boiler can generate. The only means to increase electrical generation is to replace the turbines with more efficient rotors. The more efficient rotors will have an impact on the boiler to reduce the energy of the steam returning to the boiler from the high-pressure (HP) turbine section. The improved HP turbine rotors will reduce the need for reheat sprays in the boiler due to cooler exhaust steam from the HP turbine. The reduction in reheat spray flow will result in an increase in main steam flow to the turbine without an increase in coal consumption or heat release. The turbine rotor change can be accommodated without any increase in fuel feed rates or emissions. The turbine change is not dependent on the low temperature superheater being installed.

They also intend to perform the routine maintenance replacement of the cooling tower packing material. They contend that this replacement will increase the thermal transfer efficiency of the cooling towers. They recently replaced the media in one tower and this second media replacement on the other tower is just a maintenance concern. The media needs to be thoroughly disinfected or replaced periodically as the surface area for heat transfer from the cooling water to the atmosphere is reduced by biological growths.

The purpose of the turbine change is to produce more electricity. The increased electrical output will result from the increased efficiency of the steam turbine rather than an increase in firing rate (resulting in an increase in emissions). The changes proposed to the cooling tower, the turbine rotors and the low temperature superheater tubing do not affect emissions from the facility and as such are not subject to the PSD permitting program requirements.

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### **OTHER PROJECTS**

The plant is planning on additional maintenance work at the facility. This work involves replacement of air preheater basket for Unit 2, re-tipping of primary air fan vanes, and replacement of coal pulverizer vane wheels. All 3 of these actions do not affect emissions or the capability of the plant to introduce fuel to the boilers.

The coal pulverizer vane wheel maintenance replacement is addressed above.

The re-tipping of the primary air fans and replacement of the air preheater baskets are somewhat linked. The primary air fans would not need to be re-tipped were it not from the dust in the flue gasses passing through the leaking air preheaters and entering the combustion air supply system. In the combustion air supply system, the entrained particulate has eroded the fan tips, slightly reducing their airflow capacity.

The re-tipping of the primary air fans is needed to increase the level of operational control necessary to operate the low NOx burner system. This maintenance work would not be needed yet except for the more critical operational criteria of the low NOx burner system. This maintenance work can be considered to be an integral part of the low NOx burner system. The burner system reliability would be reduced were the primary air fans left in their current condition.

The replacement of the Unit 2 air preheater basket is due to its excessive leakage rate. This leakage rate has come about due to the age of the equipment. An identical unit to the air preheater currently installed is not being considered as a replacement unit. Thus, an available unit that has a higher heat transfer rate will be installed. The hotter primary air fed to the coal pulverizers will tend to dry the coal and increase the net Btu of the coal sent to the boilers. The higher net Btu content of the coal sent to the boilers reduces the total coal consumption required to produce a given amount of steam.

### **Plant Emissions**

The RACT order sets limitations for the SO<sub>2</sub>, NOx, CO, and PM emitted by the plant. The SO<sub>2</sub> limitation is established as a moving, 12 month 10,000 tons per year limitation. This limitation is independent of firing rate or electrical demand. For other pollutants, please go to the RACT order to see the limits for the other pollutants covered by the RACT Order.

The WEPCO decision and EPA guidance on that decision along with the preamble referenced elsewhere indicates a method to determine if an emissions increase has occurred at a utility boiler. The Request for Applicability Determination based its calculations of net emission increase by applying the procedures outlined in this

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guidance. This procedure indicates that there will not be a significant net increase in any pollutant except for CO.

In addition to the method described in the WEPCO guidance, I analyzed the emissions using an alternative method based on the non-powerplant methods to determine a net emissions increase provided for in the PSD regulation and its guidance. Based on the hourly fuel consumption and emission rates in the Request for Applicability Determination, the result of this analysis is shown in the table below.

The different analyses of emissions increase have two things in common. For all pollutants evaluated except for CO the annual emissions are projected to go down or have an increase less than its PSD significance level. They also show the dramatic emissions decreases caused by installation of the pollution control project at the plant.

**Comparison of pre-change 670MW operation to post change 694 MW emissions rates**

Pollutant	At 76.5% capacity Factor		At 89% capacity factor		Emissions change	
	Pre Project, 670 net MW		Post Project, 694 net MW		(Post - pre), pounds per hour	(Post - pre), tons per year
	Emissions (lb./hr)	Emissions (ton/yr)	Emissions (lb./hr)	Emissions (ton/yr)		
CO	0.1863	1453	0.4480	3493	0.2616	2040
NOx	2.4804	19339	2.2012	17162	-0.2792	-2177
VOC	0.0223	174	0.0268	210	0.0045	35
PM	0.1627	1269	0.1565	1221	-0.0062	-48
PM10	0.1318	1028	0.1268	989	-0.0050	-39

As noted in other portions of this evaluation, the CO emissions are going up from the impact of the low NOx burners and are not subject to review under the PSD program.

The SO<sub>2</sub> emissions are going down significantly due to the need to meet the 10,000-ton per year limitation in the SWAPCA RACT Order. This is a very significant reduction from the plant's reported 75,446 tons of SO<sub>2</sub> in 1998.